Wisconsin Department of Natural Resources

Wisconsin's Northern State Forest Assessments:
Community Restoration and Old Growth on the Brule River State Forest

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Executive Summary

The Community Restoration and Old Growth Assessment Team (CROG) worked to apply a process using ecological criteria to identify and rank the natural plant community and old growth restoration potentials and opportunities. A local landscape database for the Brule River State Forest (BRSF) was developed.

To determine the role of the Brule River State Forest in conserving the regional ecology, the composition and structure of past and present plant communities in the regional landscape was assessed. The assessment included the relative size, age, and distribution of plant communities as well as their natural disturbance regimes and successional trends.

Two questions were posed. First, of the natural plant community types that occur on the BRSF, which have the greatest ecological potential for successful restoration and/or old growth?

Second, of the natural plant communities with the greatest ecological potential, where are the best sites on the BRSF to restore selected communities and/or develop old growth?

Landforms

The Lake Superior Clay Plain occupies the north half of the BRSF and the Bayfield Sand Plain occupies the south half. A very small portion of the Mille Lacs Uplands just touches the BRSF near Lake Minnesuing. An additional prominent feature is the spillway of the Brule River.

Current Plant Communities (Vegetation Associations)

Thirty-two plant communities were identified on the BRSF. The communities included 13 upland forest, 6 upland non-forest, 5 lowland forest, 5 lowland non-forest, and 3 aquatic communities. The dominant communities of the BRSF include aspen (35%), pine plantations (20%), and lowlands (14%).

Upland conifer communities include red pine (15%), jack pine (9%), fir-spruce (5%), and white pine (<1%). Upland deciduous communities include aspen (35%), scrub oak (6%), white birch (4%), and northern hardwoods (2%). European grass, in the form of old fields, covers 4% of the BRSF. Extensive lowland communities of swamp hardwoods, swamp conifers, and white cedar occur in the spillway of the Brule River south of Highway B.

1850s Vegetation

The three dominant upland plant communities in the Brule Region in the 1850s were:

- A clay plain forest that was characterized by conifers. White pine was the dominant tree with white birch and white spruce as very common associates and upland tamarack, aspen, and balsam fir as common associates. These tree species occurred in variable mixtures across the clay plain. The clay plain forest has been referred to as a boreal forest; however, the clay plain forest occurs in a temperate climate and has both temperate and boreal vegetation elements. It is unique along the Lake Superior shoreline in Wisconsin.
- Extensive barrens and jack pine forest on the sand plain.
- Areas of red pine associated with the sand plain and on terraces in the spillway of the Brule River.

Community Restoration and Old Growth Assessment

To evaluate these plant communities eight evaluation classes were selected. The evaluation classes were: community age, current acres, current abundance, presettlement abundance, ecological potential, amount of DNR ownership, and significance of the community based on the Regional Ecological Assessment and the Biodiversity Assessment.

Summary of Results

Major ecological opportunities for old growth and community restoration:

- Brule River Spillway and Tributary Streams
    - Side slopes and lowlands: Develop old growth characteristics through passive management of forests.
    - Terraces (in the Sand Plain): Begin the restoration of red and white pine as a component of these forests. In the long term (>100 years), develop old growth characteristics in the restored red and white pine forests using a variety of management techniques.
    - Terraces (in the Clay Plain): Maintain vegetation and develop old growth characteristics through passive management of forests.
- Restore the 1850s vegetation composition and structure to the clay plain forest where opportunities exist. Begin the long-term (> 100 years) process of restoring white pine, white spruce, and white birch to the clay plain forest using a variety of management techniques. Move the existing aspen-dominated forest to more closely resemble the 1850s forest. Manage

for old growth characteristics in patches of remnant clay plain forest as described in the Biotic Inventory and Analysis of the Brule River State Forest.

- Restore a small, 400 to 600-acre barrens in the Motts Ravine area of the Bayfield Sand Plain.

- Manage 354 acres of existing mature red and white pine forest for old growth characteristics.

- Maintain the existing component of jack pine forest through active forest management.

- Perpetuate and maintain uncommon and rare upland and lowland communities:

    - Upland: eastern hemlock, forested seep, Great Lakes beach, interior beach, and ephemeral pond.
    - Lowland: white cedar, tamarack, swamp conifer, swamp hardwoods, boreal rich fen, open bog, and northern sedge meadow.
    - Aquatic: lake and river shorelines and emergent aquatic beds.